UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,901	07/26/2006	Perry Peterson	20102-4	6969

1059 7590 11/25/2009

BERESKIN AND PARR LLP/S.E.N.C.R.L., s.r.l.
40 KING STREET WEST
BOX 401
TORONTO, ON M5H 3Y2
CANADA

EXAMINER	
MEROUAN, ABDERRAHIM	
ART UNIT	PAPER NUMBER
2628	

MAIL DATE	DELIVERY MODE
11/25/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,901	PETERSON, PERRY	
	Examiner	Art Unit	
	ABDERRAHIM MEROUAN	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/11/2009; 11/25/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 7-11, and 14-25, 27-39, and 41-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Wolfram (U.S Patent 4809202) hereinafter referred as Wolfram, in view of Kevin Sahr et al (NPL: Geodesic Discrete Global Grid Systems) hereinafter referred as Sahr.

3. As per claim 1, Wolfram discloses: A method for storing two-dimensional spatially organized data in one- dimensional space on a computer storage medium, the method

comprising: mapping the attributes of continuous state planar space to a multi-resolutional tessellation of close-packed uniform cells (Wolfram, Column 8 , lines 44-52, Column 2, lines 35-38, and Column 2, lines 3-5),

Wolfram doesn't disclose: a location of each cell represented by a centroid and a voronoi region created by the boundary with adjacent parent centroids forming a closed area for which properties of the cell are represented; and uniquely identifying each cell with a sequential number including the identification of a parent cell, theeach parent cell at least partially encompassing a cluster of child cells in a spatial hierarchy.

wherein relationships between parent cells and child cells are defined by the following rules: each parent cell whose centroid is not the centroid for any lower resolution cells defines a location of a single new child cell of a next highest resolution; and,

each parent cell its whose centroid is also the centroid for any lower resolution cells defines a location of multiple new child cells of the next highest resolution including, one new child cell at the centroid of the parent cell and one new child cell located at each vertex of the parent's boundary edge; ~~and~~

during initial conditions, a parent cell is assigned a general hexagon shape or with a starting centroid location that can be considered the planar origin.

However, Sahr discloses: a location of each cell represented by a centroid and a voronoi region created by the boundary with adjacent parent centroids forming a closed area for which properties of the cell are represented ; and uniquely identifying each cell with a sequential number including the identification of a parent cell, theeach parent cell at least partially

encompassing a cluster of child cells in a spatial hierarchy (Sahr, Page 121, "***Discrete Global Grid*** "lines 1-24, Page 122, "***Discrete Global system***", lines 15-24, and Figure 1)
each parent cell whose centroid is not the centroid for any lower resolution cells defines a location of a single new child cell of a next highest resolution; and, (Sahr, Page 122, "***Discrete Global Grid System***", Paragraph [0002], lines 4-15)
each parent cell its whose centroid is also the centroid for any lower resolution cells defines a location of multiple new child cells of the next highest resolution including, one new child cell at the centroid of the parent cell (Sahr, Page 122, "***Discrete Global Grid System***", Paragraph [0002], lines 4-9) and one new child cell located at each vertex of the parent's boundary edge (Sahr, Page 122, "***Discrete Global Grid System***", Paragraph [0004], lines 18-21)**; and**
during initial conditions, a parent cell is assigned a general hexagon shape with a starting centroid location that can be considered the-a planar origin (Sahr, Page 129, "Transformation", Paragraph [0005], lines 1-13, "***Sadournay et al***…").
It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Sahr into the process taught by Wolfram, because through such incorporation would provide a detailed description of a discrete global grid systems

4. As per claim 2, Wolfram in view Sahr discloses: A method according to claim 1, wherein the sequential numbers of the cells at each resolution are clustered by parent and ordered according to one of the following methods: sequential ordering, z-curve based ordering, Generalized Balanced Ternary, Gray coding, and hybridized Gray GBT ordering (Sahr, Page 127, right column, lines 27-33, "***Known as Generalized Balanced Ternary…***").

5. As per claim 3, Wolfram in view discloses: A method according to claim 1, wherein the cell can be modified by one or more of the following procedures: including one or more extra cells, excluding one or more cells, bending, joining, stretching, rotating, scaling and translating (Sahr, Page 132, right column, lines 1-12, "***In particular, we feel…***").

6. As per claim 4, Wolfram in view Sahr discloses: A method according to claim 1, wherein the sequential numbers can be modified by one or more of the following procedures: adding one or more extra levels, deleting one or more existing levels, and introducing new unique index values (Wolfram, Column 7, lines 19-27).

7. As per claim 5, Wolfram in view Sahr discloses: A method according to claim 1 the method further comprising introducing a new cell at a unique location and a specific resolution wherein an ordering precedence of the new cell supercedes an ordering precedence of neighbor cells and a behavior of the new cell is a behavior of a parent cell whose centroid is also the centroid for lower resolution cells (Sahr, Page 122, left column , ***Discrete Global Grid System, lines 1-15, " A discrete global grid…***")..

8. As per claim 7, Wolfram discloses :A discrete global grid system comprising: a processing unit, a system memory, and a system bus operatively coupling the system memory to the processing unit (Wolfram, Column 12, lines 62-68),
Wolfram doesn't disclose: wherein the system memory comprises spatially organized data, as a multi-resolutional tessellation of close-packed uniform cells, stored as a one-dimensional

georeference having had each two-dimensional cell projected from the faces of a platonic solid to a geodesic spheroid , each spatial cell being uniquely identified with a sequential number, that includes the identification of a parent cell, each parent cell encompassing a cluster of child cells in a spatial hierarchy . However Sahr discloses: wherein the system memory comprises spatially organized data, as a multi-resolutional tessellation of close-packed uniform cells, stored as a one-dimensional georeference (Sahr, Page 122, left column , Discrete Global Grid System, lines 1-15, " A discrete global grid…") having had each two-dimensional cell projected from the faces of a platonic solid to a geodesic spheroid (Sahr, Page 123, Figure 2")., each spatial cell being uniquely identified with a sequential number, that includes the identification of a parent cell, each parent cell encompassing a cluster of child cells in a spatial hierarchy (Sahr, Page 122, left column , Discrete Global Grid System, lines 16-30, " Kimerling et al. …")

It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Sahr into the process taught by Wolfram, because through such incorporation would provide a detailed description of a discrete global grid systems

9. As per claim 8, arguments used to reject claim 2, are the same arguments used to reject claim 8.

10. As per claim 9, arguments used to reject claim 3, are the same arguments used to reject claim 9.

11. As per claim 10, arguments used to reject claim 4, are the same arguments used to reject claim 10.

12. As per claim 11, arguments used to reject claim 5, are the same arguments used to reject claim 11.

13. As per claim 14, Sahr discloses: A system, wherein the system includes software instructions that mathematically convert, georeference and integrate spatial data, raster images, topological georeferenced vectors to a gridded close-packed cell reference for storage in a database or digital file (Sahr, Page 121, right column , lines 6-22, " Regular DGGs…")

14. As per claim 15, Sahr discloses: A system, wherein the system includes instructions which returns to a computer visualization device a representation of the spatially organized data associated with a spatial area and range of resolutions in the form of a whole or partial rendered image of the geodesic globe (Sahr, Page 122, right column , lines 1-9, " Discrete Global Grid…")

15. As per claim 16, Sahr discloses: A system, wherein the system includes instructions that allow data referenced to the close-packed cell grid to be advertised, shared and transmitted over a network in anyone of: a complete file transfer, a progressively transmitted transfer and a continuous state up dateable transfer (Sahr, Page 127, left column , lines 27-38, " Studies by GIS researchers…")

16. As per claim 17, Sahr discloses: A system, wherein the system includes instructions that identify on-line data referenced to a cell location as a result of a search query, displaying at an automated or manually set resolution, a pictographic symbol at the cell location on the image of the globe which further instructions provide a means to select this symbol with a cursor, activating further software instructions (Sahr, Page 122, right column, lines 1-9, " Discrete Global…")

17. As per claim 18, Sahr discloses: A system, wherein the overlapping gridded data structure provides a framework for selecting and extracting data and completion of mathematical routines for spatial integration, analysis and fusion (Sahr, Page 127, left column , lines 27-36, " Studies by GIS…").

18. As per claim 19, Sahr discloses: A system, further allowing the spatial addressing and ordering to be used as a mesh or grid for the construction of stochastic and deterministic simulation of dynamic earth events (Sahr, Page 121, left column, lines 17-21, " Application often use…").whereas the system is arranged such that users can access on-demand in a peer-to-peer environment a multitude of temporal geospatial data at each cell (Sahr, Page 127, left column , lines 27-36, " Studies by GIS…").and arranged such that this spatial data can be extracted and utilized in custom defined storage, routing and transformation routines and formulation (Sahr, Page 123, left column , lines 37-39, " Geodesic DGGSs have…", and right column, lines 1-20,"store raster… ")..

19. As per claim 20, Sahr discloses: A system, whereas the transformation routines include finite I difference methods (Sahr, Page 129, right column , lines 14-217, " They can adjusted the grid…").

20. As per claim 21, Sahr discloses: A system, whereas the transformations routines include cellular automata (Sahr, Page 127, left column , lines 20-26, " A recent texbook…").

21. As per claims 23, 37 and arguments used to reject claim 2, are the same arguments used to reject claims 23, 37.

22. As per claims 24, and 38 arguments used to reject claim 3, are the same arguments used to reject claims 24, and 38.

23. As per claim 25, Wolfram in view discloses: The method of claim 1, the method further comprising laying the cells of each tessellation onto the faces of an icosahedron and projecting the data from the faces of the icosahedron to a geodesic spheroid (Sahr, Page 124, right column, Figure 3 b-c").

24. As per claims 27, and 41 arguments used to reject claim 14, are the same arguments used to reject claims 27, and 41.

25. As per claims 28, and 42 arguments used to reject claim 15, are the same arguments used to reject claims 28 and 42.

26. As per claims 29, and 43 arguments used to reject claim 16, are the same arguments used to reject claims 29 and 43.

27. As per claims 30, and 44 arguments used to reject claim 17, are the same arguments used to reject claims 30 and 44.

28. As per claims 31, and 45 arguments used to reject claim 18, are the same arguments used to reject claims 31 and 45.

29. As per claims 32, and 46 arguments used to reject claim 19, are the same arguments used to reject claims 32 and 46.

30. As per claims 33, and 47 arguments used to reject claim 19, are the same arguments used to reject claims 33, and 47.

31. As per claims 34, and 48 arguments used to reject claim 20, are the same arguments used to reject claims 34, and 48.

32. As per claims 35, and 49 arguments used to reject claim 21, are the same arguments used to reject claims 35, and 49.

33. As per claims 22, and 36, arguments used to reject claims 1 and 7, are the same arguments used to reject claims 22, and 36.

34. As per claim 39, arguments used to reject claim 25, are the same arguments used to reject claim 39.

35. Claims 6, 12-13, 26 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Wolfram (U.S Patent 4809202) hereinafter referred as Wolfram, in view of Kevin Sahr et al (NPL: Geodesic Discrete Global Grid Systems) hereinafter referred as Sahr, and further in view of Brueckner et al. (USPG-PUB 2002/0069018 A1) hereinafter referred as Brueckner.

36. As per claim 6, Wolfram in view of Sahr discloses: A method according to claim 1. Wolfram in view of Sahr doesn't disclose: wherein two or more cells may be introduced at any unique locations and specific resolution and wherein the boundary of two or three of the new cells share vertices, such vertices define the location of new child cells and the child cells shall be uniquely indexed with reference to its three shared parents, and the behavior of these child cells are considered as a parent cell for which their centroid location is not a centroid location for any lower resolution cells .However, Brueckner discloses: wherein two or more cells may be introduced at any unique locations and specific resolution and wherein the boundary of two or three of the new cells share vertices, such vertices define the location of new child cells and the child cells shall be uniquely indexed with reference to its three shared parents (Brueckner, Page 15, Paragraph[0241], and Figure 25), and the behavior of these child cells are considered as a

parent cell for which their centroid location is not a centroid location for any lower resolution cells (Brueckner, Page 16, Paragraph[0261], lines 6-13, and Figure 35).
It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Brueckner into the process taught by Wolfram in view of Sahr, because through such incorporation would provide the resolution at each location of the cells.

37. As per claim 12, arguments used to reject claim 6, are the same arguments used to reject claim 12.

38. As per claim 13, Wolfram in view of Sahr, and in view of Brueckner discloses: A system, where the shape, orientation and projection conforms to the Icosahedron Snyder Equal Area Aperture 3 Hexagon Grid (Sahr, Page 128, left column , lines 35-38, " Figure 11 illustrates…") and the division of the icosahedron surface begins with the introduction of 12 points, one on each icosahedron vertex, resulting in pentagonal shaped voronoi regions with shared cell vertices located at the center of the icosahedron faces (Sahr, Page 125, left column , lines 9-13, " Wickman et al. ……") , further defining 20 second generation hexagonal cells at each of these shared vertices and 12 second generation pentagonal cells each at the icosahedron's vertices (Sahr, Page 125, left column , lines 9-19, " Wickman et al…").

39. As per claims 26, and 40 arguments used to reject claim 13, are the same arguments used to reject claims 26 and 40.

Response to Arguments

40. Applicant's arguments directed to claims 1-49 have been fully considered but they are not persuasive.

41. In response to applicant's argument for claims 1, 7, 22, and 36, applicant argues on page 16 that the prior art doesn't disclose:" ... that the indexing method disclosed in the independent claims of the present application is not obvious in view of the prior art.". Examiner respectfully disagrees with the argument because Sahr stated that:" Klmerhng et al. (1999) and Clarke (2002) note the importance of regular ***hierarchical relationships*** between DGGS resolutions in creating efficient data structures. Two types of hierarchical relationship are common. A DGGS is *congruent* if and only if each resolution k cell region consists of a union of resolution ***k+l*** cell regions. A DGGS is *aligned* if and only if each resolution ***k*** cell point is also a cell point in resolution ***k+l.*** If a DGGS does not have these properties, the system is defined as *incongruent* or *unaligned.* For example, the most widely used DGGS is generated implicitly by multiple precisions of decimal geographic vector representations. This DGGS has an aperture of 10 and is incongruent and aligned (Figure 1)."(Sahr, Page 122, left column, "Discrete Global Grid System")

Conclusion

42. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDERRAHIM MEROUAN whose telephone number is (571)270-5254. The examiner can normally be reached on Monday to Friday 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on (571) 272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Abderrahim Merouan/
Examiner, Art Unit 2628

/XIAO M. WU/
Supervisory Patent Examiner, Art Unit 2628